UTM
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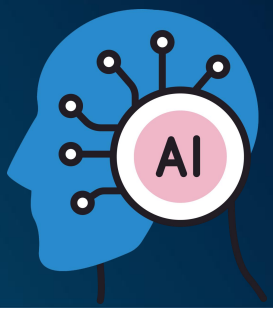

Project management & System development

——— Core position, framework, AI application

Group members :

A24CS4099 SONG HUIXU

A24CS4102 LUO CIMEI

A25CS4020 SHI KAIYUAN

A24CS4098 YUAN WENYAO

Project management

Project Management: Strategic Planning and Methodology

1. Definition and Significance

Based on the insights from Tuan Hj. Abdul Alim, project management is fundamentally about planning. He emphasized that "failing to plan is planning for failure." Academically, it involves applying processes and skills to achieve specific goals within agreed parameters. Effective project management is essential for navigating system complexity and ensuring technical solutions align with organizational goals (Kerzner, 2022). It serves to control chaos by maintaining project scope and fostering team synergy among diverse roles.Sommerville, I. (2016). Software Engineering. Pearson Education.

2. Methodologies: Waterfall vs. Agile

The speaker contrasted two dominant industry methodologies:

Waterfall Model: A linear, sequential approach where each phase must be completed before the next. Sommerville (2016) states that Waterfall is most effective when requirements are well-defined and unlikely to change. * Agile Methodology: A flexible, iterative approach that prioritizes rapid feedback. The Scrum framework, mentioned by the speaker, uses "daily stand-ups" to synchronize efforts. Research suggests Agile is superior for projects with evolving requirements and high uncertainty (Highsmith, 2002).

3.Application in Network and Security

In the Network and Security program, project management integrates security protocols into the initial design phase, aligns risk assessments with vulnerability management, and ensures that complex infrastructure deployments do not disrupt active business networks.

System development

The Software Development Life Cycle (SDLC) is a critical component of software development. It provides a structured framework that guides the entire development process, ensuring quality, efficiency, and maintainability.It has six steps, including Analysis,Design,Implementation,Testing, Deployment,Maintenance

1.**Data Engineering**

System development supports **data pipelines**, **ETL processes**, and **model-based systems engineering** to handle large-scale data.e.g:Model-based systems engineering (MBSE) integrates system analysis with graph data engineering, enabling complex correlation analysis and structured workflows.(Schummer and Hyba ,2022)DCE_2200033 1..30

2.**Computer networks**

System development in networking focuses on **protocol design**, **network optimization**, and **security frameworks**.e.g: Innovative strategies in computer network development highlight how system-level approaches transform productivity and lifestyle paradigms.(Xu, Zhou and Zhang ,2024)

3.**Bioinformatics**

System development is crucial for **bioinformatics software**, integrating **systems biology** with computational tools to improve diagnostics and therapeutics.e.g:Systems bioinformatics uses network-based approaches to enhance precision in computational diagnostics and therapeutic modeling. (Oulas, Minadakis, Zachariou, Sokratous, Bourdakou and Spyrou ,2019)

4.**Computer Graphics**

System development in graphics enables **visualization systems**, **rendering engines**, and **simulation frameworks**.e.g:Research in computer graphics emphasizes system-level design for creating, manipulating, and representing visual images and animations across entertainment and scientific visualization. (Finesilver ,2022)

Industry Talk

Industry Talk: Overview and Speaker Experience

1. Background of the Industry Talk

The industry talk focused on Project Management and System Development as essential skills for computer science students entering the technology industry. The speaker emphasized that software development is not limited to writing code, but involves systematic planning, coordination, and decision-making throughout the entire development process. The talk highlighted how structured approaches are required to manage complexity and ensure project success in real-world environments.

2. Speaker Experience and Industry Perspective

During the talk, the speaker shared insights based on personal industry experience, particularly challenges faced during the early stage of the career. The speaker explained that a lack of practical understanding of system development concepts, such as structured development processes, can make it difficult to communicate ideas effectively in professional settings, including job interviews.The speaker stressed that project management and system development should be treated as core professional competencies rather than academic theory. Through real-world examples, the talk demonstrated how poor planning and weak coordination can lead to project delays, inefficiency, and failure. This sharing provided students with a clearer understanding of industry expectations and the importance of developing system-level thinking early in their academic journey.

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Reflection

This industry talk helped me realize that system development and project management are core skills that should not be ignored during my study years. The speaker clearly explained that system development is not just writing code, but a complete process that includes planning, analysis, design, implementation, and maintenance. This changed the way I view software development.

One important point mentioned in the talk was the “FYP Trap”. Many students only focus on coding in the early years and panic when they reach the Final Year Project because they are not ready to build a complete system. This made me understand the importance of developing system thinking early instead of waiting until Year 4.

The speaker also highlighted future trends such as agentic coding, where AI tools handle coding tasks while humans focus more on system design and decision making. The success formula shared in the talk showed that combining coding skills with system and project management skills is necessary to be future ready.

In the next four years, I plan to improve my understanding of system development, requirement gathering, and project planning. By building these skills together with technical knowledge, I believe I will be better prepared for my Final Year Project and future career in the computer science field.

Reference

1. Systems Bioinformatics: increasing precision of computational diagnostics and therapeutics through network-based approaches | Briefings in Bioinformatics | Oxford Academic

2. Highsmith, J. A. (2002). Agile Software Development Ecosystems. Addison-Wesley Professional

Kerzner, H. (2022). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*. John Wiley & Sons.